

INF-0010

REMARKS

Claims 1-18 are pending in the present Application. Claim 1 has been amended and no claims have been cancelled or added, leaving Claims 1-18 for consideration upon entry of the present Amendment. No new matter has been introduced by way of amendment. For example, support for the amendment to Claim 1 can be found in both paragraphs [0017] and [0018] of the Specification as originally filed.

Reconsideration and allowance of the claims are respectfully requested in view of the above and the following remarks.

First Claim Rejection Under 35 U.S.C. § 103(a)

Claims 1, 2, 4-18 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over International Patent Application Publication No. WO 97/05994 to Hunt *et al.* (hereinafter "Hunt") in view of U.S. Patent Application Publication No. 2002/0062789 to Nguyen *et al.* (hereinafter "Nguyen") and further in view of International Patent Application No. WO 00/00660 to Chow *et al.* (hereinafter "Chow"). Applicants respectfully traverse this rejection.

Independent Claim 1 is directed to an apparatus for the thermal spray delivery of a solution, said apparatus comprising: a first solution reservoir; a second solution reservoir; a singular or multiple liquid injector(s) disposed in fluid communication with said reservoirs; a flame source configured to direct a thermal spray from said liquid injector to a substrate, wherein said thermal spray from said liquid injector(s) comprises at least partially melted particles and a non-liquid material; a thermal control device disposed in thermal communication with said substrate; and a chamber enclosing the flame source and substrate which facilitates use of inert gas blanketing.

Hunt is directed to a method and device for combustion chemical vapor deposition using a very fine atomization or vaporization of a reagent containing liquid or liquid like fluid near its

INF-0010

supercritical temperature, wherein the resulting atomized or vaporized solution is entered into a flame or plasma torch to produce the deposited product (e.g., coating or powder).

Nguyen is directed to a method and apparatus for the chemical vapor deposition of multi-layer films.

Chow is directed to nanoscale coatings formed from thermal spray processes using solution precursor feedstocks.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Applicants respectfully contend that a *prima facie* case of obviousness has not been established because the cited art, individually or in combination, fails to teach all elements of Applicants' independent Claim 1. Specifically, noticeably absent from Hunt, Nguyen, and Chow is at least the feature "a flame source configured to direct a thermal spray from said liquid injector to a substrate, wherein said thermal spray from said liquid injector(s) comprises at least partially melted particles and a non-liquid material". In fact, Nguyen fails to even mention the use of a flame source. While Hunt and Chow disclose a flame source, they fails to teach or suggest that the *thermal spray from the liquid injector(s) comprises at least partially melted particles and a non-liquid material*.

INF-0010

As stated above, Hunt is directed to *vapor deposited* films using combustion chemical *vapor* deposition. The Examiner's attention is respectfully directed to the Specification of Hunt, a relevant portion of which is reproduced for convenience as shown below.

This invention relates to methods of powder formation and thin film deposition from reagents contained in liquid or liquid-like fluid solutions, whereby the fluid solution, near its supercritical point temperature, is released into a region of lower pressure causing a superior, very fine atomization or vaporization of the solution. **Gasses are entrained or fed into the dispersed solution and rapidly flow into a flame or plasma torch. The reagents react and form either: 1) powders which are collected; or 2) a coating from the vapor phase onto a substrate positioned in the resulting gases and vapors.** Release of the near supercritical point temperature fluid causes dispersion and expansion resulting in a very fine nebulization of the solution, which yields improved powder and film quality, deposition rates and increases the number of possible usable precursors.

(Hunt; page 1, lines 9-19; emphasis added)

As described in the above cited portion of Hunt, as well as in the previously cited portions of Hunt (i.e., in Applicants' previous response dated August 25, 2005), the flame source is used only to provide sufficient energy to convert a nebulized or vaporized precursor solution into a final product, which forms on the substrate from the vapor phase. If the reacted reagents are in the vapor phase, they cannot comprise *at least partially melted particles and a non-liquid material* as instantly claimed.

Therefore, Hunt fails to teach or suggest "a flame source configured to direct a thermal spray from said liquid injector to a substrate, wherein said thermal spray from said liquid injector(s) comprises at least partially melted particles and a non-liquid material". Owing to its absolute silence regarding a flame source, Nguyen too fails to teach or suggest this feature. In addition, Chow fails to compensate for the deficiencies of Hunt and Nguyen, because Chow too fails to teach or suggest a thermal spray comprising at least partially melted particles and a non-liquid material. Accordingly, the cited references do not establish a *prima facie* case of obviousness.

INF-0010

Applicants again note that both Hunt and Nguyen are directed towards chemical vapor deposition (CVD) processes and apparatuses. As known to those skilled in the art of Applicants' disclosure, CVD is markedly different from thermal spraying. This is described not only in Hunt, but also in Chow. Therefore, Applicants also traverse the rejection on the grounds that Hunt and Nguyen are non-analogous art, and cannot possibly be combined render obvious claims directed to an "apparatus for the thermal spray delivery of a solution". Furthermore, for the same reasons, Applicants respectfully contend that Hunt and Nguyen should not be combined with Chow.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection to Claims 1, 2, and 4-18.

Second Claim Rejection Under 35 U.S.C. § 103(a)

Claim 3 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Hunt in view of Nguyen and Chow as applied to Claim 1 in the First Claim Rejection Under 35 U.S.C. § 103(a) above, and further in view of International Patent Application Publication No. WO 98/41316 to De Graaf *et al.* (hereinafter "De Graaf"). Applicants respectfully traverse this rejection.

Hunt, Nguyen, and Chow are discussed above.

De Graaf is directed to an apparatus for applying multi-component coating compositions.

Applicants assert that a *prima facie* case of obviousness has not been established against Applicants independent Claims 1 because De Graaf fails to compensate for the deficiencies of Hunt, Nguyen, and Chow. Like Nguyen, De Graaf is silent regarding a flame source. Thus, the cited references fail to teach all elements of the claims, notably the "flame source configured to direct a thermal spray from said liquid injector to a substrate, wherein said thermal spray from said liquid injector(s) comprises at least partially melted particles and a non-liquid material".

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection to Claim 3.

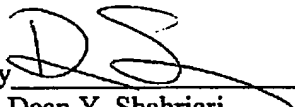
INF-0010

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP

By 
Dean Y. Shahriari
Registration No. 56,783

Date: February 16, 2006
Telephone (404) 607-9991
Facsimile (404) 607-9981
Customer No.: 23413